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# Whose butt is it? tobacco industry research about smokers and cigarette butt waste

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## ABSTRACT

**Background** Cigarette filters are made of non-biodegradable cellulose acetate. As much as 766 571 metric tons of butts wind up as litter worldwide per year. Numerous proposals have been made to prevent or mitigate cigarette butt pollution, but none has been effective; cigarette butts are consistently found to be the single most collected item in beach clean-ups and litter surveys.

**Methods** We searched the Legacy Tobacco Documents Library (<http://legacy.library.ucsf.edu>) and <http://tobaccodocuments.org> using a snowball strategy beginning with keywords (eg, 'filter', 'biodegradable', 'butts'). Data from approximately 680 documents, dated 1959–2006, were analysed using an interpretive approach.

**Results** The tobacco industry has feared being held responsible for cigarette litter for more than 20 years. Their efforts to avoid this responsibility included developing biodegradable filters, creating anti-litter campaigns, and distributing portable and permanent ashtrays. They concluded that biodegradable filters would probably encourage littering and would not be marketable, and that smokers were defensive about discarding their tobacco butts and not amenable to anti-litter efforts.

**Conclusions** Tobacco control and environmental advocates should develop partnerships to compel the industry to take financial and practical responsibility for cigarette butt waste.

including arsenic, cadmium and toluene.<sup>1</sup> In beach clean-up campaigns cigarette butts are consistently found to be the single most collected item.<sup>10</sup> As many as 5.6 trillion cigarettes or 766 571 metric tons of butts are deposited into the environment worldwide every year.<sup>11</sup> Whether they cause significant environmental damage is unknown, but municipalities and other entities incur substantial costs to clean them up. The city of San Francisco, California, USA, estimates this cost at \$7.4 million annually.<sup>12</sup>

Numerous proposals have been made to prevent or mitigate cigarette butt pollution, including labelling filters as non-biodegradable, deposit/return programmes, waste fees, litigation against the tobacco industry to recover clean-up costs, fines levied against consumers or tobacco companies, mandated filter biodegradability, a ban on filters and consumer education.<sup>5</sup> To date, only consumer education has been used with any consistency, although San Francisco recently imposed a waste fee of \$0.20 per pack to cigarettes sold within the city.<sup>13</sup>

## Littering behaviour

Why some individuals litter and others do not is not well understood, although it is thought that young adults litter more than other age groups.<sup>14–16</sup> Littering behaviour can be affected by item type (eg, cigarette butt vs beverage container) and by location (eg, street vs park).<sup>15</sup> Litterers may not recognise their own behaviour as littering,<sup>14</sup> making it difficult to target. Most of the literature on littering dates from the 1970s and 1980s, and none deals specifically with cigarette butt waste. It is possible that changing smoking prevalence rates and social attitudes towards smoking have affected cigarette butt littering. The passage of clean indoor air laws may exacerbate the butt waste problem as more cigarettes are smoked outdoors<sup>17</sup>; this hypothesis remains untested.

Nearly every aspect of smoking has been the subject of extensive research by the tobacco industry, frequently years or decades in advance of the published scientific literature.<sup>18–20</sup> Industry research can help advocates design and implement effective tobacco control policy.<sup>21–23</sup> Previous studies have shown that the industry has been concerned for decades that cigarette litter might increase the social unacceptability of smoking, inspire support for tobacco control, or result in legislation requiring them to take fiscal or practical responsibility for cigarette waste disposal. As a policy response, the industry has sponsored anti-littering groups, distributed portable ashtrays (frequently branded) and

## INTRODUCTION

The health consequences of tobacco use are well known: tobacco use causes many cancers, as well as heart disease, emphysema and many other illnesses.<sup>1</sup> If current trends continue, tobacco use will kill 1 billion people worldwide in the 21st century.<sup>1</sup> In addition to direct health effects, tobacco growing and curing has environmental impacts resulting from deforestation<sup>2,3</sup> and water contamination due to pesticide use.<sup>4</sup> Other such harms are just beginning to be understood,<sup>5</sup> and among these is the environmental damage that littered cigarette butt waste may cause.

## The cigarette butt problem

Cigarette filters are a marketing tool,<sup>6</sup> originally intended to keep loose tobacco out of the smoker's mouth,<sup>7</sup> not to protect the health of smokers. Indeed, filters have been implicated in increased rates of adenocarcinoma.<sup>8</sup> Filters are made of cellulose acetate, which is photodegradable,<sup>9</sup> but not biodegradable; they trap residues from smoking



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installed permanent ashtrays in downtown areas of numerous cities.<sup>24</sup> None of these has solved the problem. This study seeks to illuminate some reasons for this failure by examining tobacco industry research relating to smokers' littering beliefs and behaviours.

## METHODS

Over 10 million tobacco industry internal documents have been released through litigation.<sup>25</sup> We searched the Legacy Tobacco Documents Library (<http://legacy.library.ucsf.edu>) using a snowball strategy<sup>26</sup> beginning with keywords (eg, 'filter', 'biodegradable', 'butts'). Data from approximately 680 documents, dated 1959–2006, were analysed using an interpretive approach<sup>27–30</sup> in which, 'Each document (is) reviewed carefully and the 'taken for granted' assumptions and viewpoints of the author(s) drawn out'.<sup>31</sup>

Many of the documents referenced are focus groups or interviews the tobacco industry commissioned to better inform themselves of smokers' feelings and opinions about cigarette butts and littering (details about focus groups are given in table 1). Focus groups are not intended to be representative and statistically generalisable; rather, they are used to gather impressions about the range of opinions on a given subject<sup>49</sup>; however, the fact that multiple focus groups reported similar ideas suggests that the focus group findings are not entirely anomalous. Most of these focus groups were performed in the late 1990s or early 21st century. Some were specifically designed to give the industry guidance about how to address the cigarette litter problem; in others, the issue was raised by smokers as one of the problems of smoking.

## RESULTS

The industry's consistent position has been that 'the responsibility for proper disposal' of cigarette waste belongs to the smoker.<sup>24 50–53</sup> In hope of persuading them to take that responsibility, the tobacco companies studied smokers' attitudes, beliefs and desires about cigarette butts in inquiries about smokers' ideas for new products, specific studies about litter and tests of marketing material. Common themes emerging from these materials reveal the human element of the butt waste problem.

### Smoker beliefs and behaviours

#### Beliefs about filters

Most smokers realised that filters were not biodegradable<sup>32</sup>; however, there were some smokers who did not.<sup>32</sup> Some 'rejected, or were unaware, of any environmental impact of butts'.<sup>54</sup> (Some also believed that Camels in particular had 'cotton, biodegradable' filters<sup>33</sup>—a perception that continues today.<sup>55</sup>)

The potential toxicity of cigarette filters was noticeably absent from industry discussions of the problem, and smokers appeared oblivious to it. RJ Reynolds (RJR) held a number of 'product ideation' sessions with smokers,<sup>33</sup> in which smokers suggested solutions to the butt litter problem, including creating edible filters, made of 'mint candy' or 'crackers'.<sup>33</sup> Other suggestions included using the filters as compost or mulch: 'make it work with nature instead of against it'.<sup>33</sup> One group discussed the idea of dissolving filters, but was concerned about possible harm to the water system.<sup>34</sup> These focus groups were not designed to constrain ideas to the realistic or feasible; however, even the industry report noted that although smokers

said they disliked 'seeing butts in their own yards and in their own ashtrays', they were not 'worried about what butts do to the soil, landfills or rivers'.<sup>34</sup>

### Smokers' behaviour and attitudes about butts

RJR research found that 'Most smokers say they hate to see cigarette litter'.<sup>34</sup> They disliked seeing others empty ashtrays in parking lots or on the street.<sup>34</sup> They also found butts repugnant when disposed of appropriately, commenting that an ashtray full of butts was 'disgusting',<sup>35</sup> that they didn't want to 'clutter up' ashtrays by using them for cigarettes,<sup>35</sup> and preferred not to dispose of butts in their cars.<sup>56</sup>

Although a Philip Morris (PM) study found that 'virtually all respondents' felt that litter was a consequence of 'apathy, laziness, and insensitivity', they nonetheless 'admitted that they do litter with cigarette butts'.<sup>32</sup> Some studies quantified the number of smokers that littered: estimates ranged from 45%<sup>36</sup> to 75%<sup>37</sup> to 92% of smokers aged 21–25.<sup>37</sup> Only slightly more than half of smokers surveyed in the UK had ever used a waste bin for their cigarette butts.<sup>37</sup>

Smokers gave various reasons for littering. Tossing a butt to the ground and stepping on it was felt by some to be a 'natural extension of the defiant/rebellious smoking ritual'.<sup>32</sup> By contrast, other smokers believed that it was 'a conscientious thing to do',<sup>32</sup> since it eliminated the risk of fire. This logic was particularly prevalent in British studies; over half the respondents in one study,<sup>37</sup> and over a quarter in another,<sup>54</sup> mentioned fire risk as a reason for not putting butts in waste bins.<sup>56</sup>

Many smokers suggested that they were compelled to litter, asking, 'What else am I going to do with them?'<sup>54</sup> Smokers said that they wished they didn't 'have to bury the butt in the bushes',<sup>57</sup> or 'have to throw them on the ground'<sup>35</sup> when no ashtray was available. Others similarly wished they 'didn't have to throw the cigarette butt out the window' when driving (emphases added).<sup>33</sup>

Some who 'felt guilty' about smoking 'were interested in unloading their cigarettes as quickly as possible',<sup>32</sup> and thus disinclined to seek out an ashtray. Similarly, some smokers did not like using ashtrays 'because they can see how many cigarettes they have smoked'.<sup>58</sup> But litter also contributed to guilt. One respondent commented, 'an ash tray emptied in a parking lot... makes us all look like pigs'.<sup>34</sup>

Many smokers made a distinction between cigarette butts and other litter. Focus groups said that 'flicking' a cigarette was 'so widespread' it was 'almost acceptable', and smokers and non-smokers agreed that this 'was a less flagrant litter violation than tossing a bottle/can'.<sup>32 56</sup> Some smokers felt they had permission to litter, because cigarette butts were not 'viewed as causing significant harm to the environment'.<sup>57</sup>

Butts and littering annoyed non-smokers.<sup>38 39</sup> People associated 'heaps of cigarette butts [eg, from dumping auto ashtrays] with a lack of concern for other people, selfishness and an almost personal assault'.<sup>40 59</sup> Some believed that smokers frustrated by clean indoor air laws were deliberately littering in front of public buildings, to 'send the establishment a message',<sup>41</sup> or that they littered out of spite.<sup>42</sup> A PM executive acknowledged that, 'Anecdotally, many non-smokers, and smokers, find [litter] the most offensive element of smoking'.<sup>60</sup>

### Changing the product

The simplest way to solve the problem, some tobacco company employees suggested, would be to return to unfiltered

**Table 1** Tobacco industry focus group data

Company	Year	Location	Topic/purpose	No. of groups/respondents	Demographics/methods
Philip Morris (PM)	1997	Boston, Massachusetts	Smoker and non-smoker attitudes/perceptions of litter in general, and a range of issues surrounding cigarette butt litter <sup>32</sup>	Six groups	Four groups of smokers: two groups 21–34-year-olds (white collar/blue collar); two groups aged 35+ (white collar/blue collar). Two groups of non-smokers: one group of 21–34-year-olds; one group aged 35+; mix of white collar and blue collar.
RJ Reynolds (RJR)	1992	Santa Fe, New Mexico Indianapolis, Indiana Boise, Idaho Providence, Rhode Island Dallas, Texas	Consumer product idea generation <sup>33</sup> Consumer product idea generation Consumer product idea generation Consumer product idea generation Product idea generation	Two groups Two groups Two groups Three groups Two groups	The two groups contained a cross-section of men and women smokers, 25–49 years of age and a cross-section of income levels, education and employment  Two groups as above; third group with women who were primarily housewives 7-Eleven store managers 7-Eleven store clerks
RJR	1993	Sioux Falls, South Dakota; Madison, Wisconsin; St Louis, Missouri	Idea generation Development of a more environmentally-friendly cigarette <sup>34</sup>	One group 12 triads and 2 focus groups per city	A combination of managers and clerks from previous Dallas group A cross-section of smokers that included men and women, high, middle and low education, high, middle and low income
PM	1986	Six cities	Evaluate 26 novel product ideas <sup>35</sup>	693 interviews	Smokers recruited by mail intercept
PM	1995	Chicago, Illinois	Consumers' reactions to environmental issues <sup>36</sup>	148 self-administered questionnaires	Men and women smokers, aged 18–55 years old
PM	1995	Owings Mills, Maryland	Consumers' reactions to environmental issues <sup>36</sup>	20 one-on-one interviews	Smokers, men and women, aged 18–55 years old.
Tidy Britain Group	1996	UK (national)	Attitudes of smokers towards cigarette disposal outdoors <sup>37</sup>	918 interviews face-to-face on the street	A representative number of smokers in each of the categories of nation/region, age, sex and social class
British American Tobacco (BAT)	1980	UK	To provide information on the likely social pressure, if any, against smoking; and what priority anti-smoking feeling had among other social concerns. To explore fully which components of smoking upset or annoy people and whether these differ between smokers and non-smokers.	Four groups Four mini groups Four mini groups	Smokers, men 20–40, ABC1; smokers, men 20–40, C2DE; smokers, women 20–40, ABC1; smokers, women 20–40, C2DE. Ex-smokers: two groups men 20–40, ABC; two groups women 20–40, C2DE. Never smokers: two groups men 20–40, ABC1; two groups women 20–40, C2DE.
			To provide an opportunity for the confrontation of smokers and non-smokers. To determine how smokers actually react to social pressure about smoking. <sup>38</sup>	Four groups	Two groups of men, 20–40, four smokers, two ex-smokers, two never smokers. Two groups of women, 20–40, four smokers, two ex-smokers, two never smokers.
RJR	1978	New York City, New York Cincinnati, Ohio San Francisco, California	The dimensions of consumers' views of the social and regulatory aspects of smoking <sup>39</sup>	Six groups	All respondents were between 18 and 55 years of age. Men and women were equally represented in the groups held in New York and San Francisco, but in Cincinnati, one group was all men and the other was all women. Smokers and non-smokers.
RJR	1985	Boston, Massachusetts Minneapolis, Minnesota San Francisco, California Los Angeles, California Atlanta, Georgia Dallas, Texas Kansas City, Missouri	Smoking concerns in relation to other issues; meanings of and attributions towards smoking and smokers; responses to smoking in situational contexts; propensity of the anti-smoker to take action; and hypothesised pathological characteristics of the anti-smoker <sup>40</sup>	89 group participants, 93 interviewees	Interviews in group and individual settings, administering written material and addressing parallel issues in both settings. Respondents were selected to ensure reasonable distributions of age, sex, socioeconomic status and smoking status.

Continued

Table 1 Continued

Company	Year	Location	Topic/purpose	No. of groups/respondents	Demographics/methods
RJR	2004	West Coast USA Seattle, Washington	To meet the group and confirm that the newly formed company (Reynolds American) was committed to continuing the corporate social responsibility engagement and dialogue process <sup>41</sup>	One group One group	Members of a western state public health department and tobacco control group. A doctor, a restaurant manager, a police officer, a parent-teacher association representative, a director of a non-profit community organisation, a leader of a local church, a student active in college social and student government affairs and an owner of a local convenience store. Members of the health department.
		Southeast USA	To further the company's understanding of the actions expected of a responsible tobacco company <sup>41</sup>	One group	
		Bangor, Maine	Public perceptions of the tobacco industry <sup>41</sup>	One group	Members of the greater Bangor, Maine community. That group included a member of the clergy, a parent-teacher association member, a mother of teenagers, an elected council member, a convenience store owner, a restaurant/bar manager, a college student, the director of a non-profit organisation and a police officer.
RJR	2006	West Coast USA	Tobacco control policy issues <sup>41</sup>	One group	The head of a county lung association and a retired doctor who chairs a county tobacco control coalition
PM	1998	Dallas, Texas	Clean indoor air policies <sup>42</sup>	Seven groups	Restaurant owners/managers Managers of manufacturing workplaces Non-smoking consumers Smoking consumers Workplace owners/warehouse companies Workplace owners/manufacturing companies Bar/restaurant managers
Brown & Williamson (B&W)	1996	Minneapolis, Minnesota Los Angeles, California	Identify the most promising selling propositions for 'natural' cigarettes <sup>43</sup>	14 groups	10 groups of smokers, 21–55 Two groups of smokers, 21–39 Two groups of smokers, 40–55
BAT	1993	Switzerland	'Ecological' cigarette concept <sup>44</sup>	Nine groups	Mixed sex group, 18–35; non-smokers and ex-smokers Mixed sex, smokers 18–25 Three groups women smokers 18–35 Three groups men smokers 18–35 Mixed sex smokers 18–35; ecological sensitives
PM	1992	Seattle, Washington Atlanta, Georgia	Litter, ashtrays <sup>45</sup>	Six groups	Six groups: three smoker and three non-smoker. The smoking and non-smoking groups were broken into three age brackets: 18–24; 25–34; 35–50.
RJR	1993	Birmingham, Alabama	To explore smokers' reactions to concepts that build on social responsibility, to aid in the development of direct mail pieces <sup>46</sup>	Six groups	Two groups of male and female smokers, 25–60 Two groups of male smokers, 25–60 Two groups of female smokers, 25–60
PM	1986	Atlanta, Georgia Boston, Massachusetts Chicago, Illinois Dallas, Texas Seattle, Washington	The purpose of the social aspect of smoking focus groups was to generate some discussion on concepts for new cigarette ideas that address issues of social and health importance <sup>47</sup>	10 groups	Two groups per city, smokers aged 35 and younger and aged 36 to 65
B&W	1996	Minneapolis, Minnesota	Environmentally-friendly cigarette concepts <sup>48</sup>	Six groups	Two groups of smokers, 21–40 One group of smokers, 40–55 Three groups of smokers, age unspecified



cigarettes.<sup>61 62</sup> The suggestion was not acted upon; it was believed that it was 'an easier sell to make [filters] biodegradable' than to 'convince people that "unfiltered" cigarettes will still be mild and smooth'.<sup>34</sup> The industry saw several advantages to a biodegradable filter. It might stem the growing disapproval of smokers and of smoking,<sup>63</sup> prepare the industry for future regulation requiring biodegradability,<sup>64 65</sup> or even 'pre-empt environmental legislation'<sup>66 67</sup>—that is, make regulation appear unnecessary. A biodegradable filter might also improve a company's image, countering 'the negative publicity that the industry receives when litter surveys are published'.<sup>68</sup>

By contrast, promoting an 'ecofriendly' brand by implication raised questions about the degradability of other cigarettes.<sup>66</sup> Tobacco companies were reluctant to disclose how poorly filters degraded. RJR frequently claimed that filters were degradable<sup>69–72</sup> in 6 months<sup>70</sup> or 'less than a year'.<sup>72</sup> The company disingenuously claimed that butts were not a litter problem because 'practically all the materials we use have a degree of biodegradability'.<sup>71</sup>

The companies knew that biodegradable filters might actually encourage littering. British American Tobacco (BAT) suggested that such filters would offer 'outdoor convenience' by 'eliminating' litter.<sup>73</sup> A focus group participant wanted biodegradable filters because 'I want to just throw them down, but I don't want to feel bad about it'.<sup>34</sup> Brown & Williamson concluded that the 'perceived benefit' of a biodegradable filter was 'the ability to litter without guilt'.<sup>43 48</sup>

A related problem was that biodegradation was not instantaneous. A focus group report acknowledged that biodegradable filters 'have all of the right buzz-words', but 'they may not degrade as quickly as smokers really want'.<sup>34</sup> Smokers wanted a butt that disappeared.<sup>33</sup> A BAT report concluded that 'it is clear that a cigarette butt that miraculously vanishes, leaving behind it no distasteful sight or smell would represent a huge step forward for both smoker and non-smoker'.<sup>38</sup> The question for the industry was whether anything less would satisfy the claim of biodegradability.

Finally, there was a tension between using biodegradable filter technology to benefit a particular company, and using it to improve the image<sup>33 74</sup> (and self-image)<sup>44</sup> of smokers. BAT was 'looking for a market lead and therefore commercial secrecy'<sup>64</sup> about such technology, but the company also recognised that, 'When all discarded filter tips look alike to the public the fact that some degrade more quickly than others may be of academic interest only, if the majority do not. For certain it is fanciful to expect gratuitous attribution of success from the public through elimination of only a small part of the problem'.<sup>75</sup>

## Changing smoker behaviour

### Anti-litter campaigns

Several tobacco companies developed anti-litter campaigns,<sup>76 77</sup> deciding that the solution was 'education(.) not materials science'.<sup>78</sup> However, industry research suggested that such a campaign had to be formulated carefully. Smokers feared that an anti-litter campaign could become 'another thing non-smokers can attack us for'.<sup>32</sup> Thus, although most smokers admitted to littering, they felt defensive since butts were 'just a small part of a big problem'.<sup>79</sup> Even though the campaigns were supposed to make smokers aware that butts were litter,<sup>80</sup> they could not single out smokers as litterers or equate smoking with littering.<sup>32</sup> Smokers preferred slogans

defining the problem 'as a litter issue rather than a smoking issue'.<sup>54</sup>

Smokers were sensitive to anything that could be interpreted as accusatory or critical,<sup>32 54</sup> preferring a 'gentle nudge' to modify their behaviour.<sup>58</sup> In Australia, smokers accepted a 'Please bin your butts' campaign, feeling that it was non-confrontational and acknowledged the right to smoke.<sup>54</sup> However, in the US, although focus group members appreciated being reminded of their 'rights', they 'did not want to be part of 'another cigarette controversy''.<sup>57</sup>

In the US, smokers liked the slogan, 'a little thought, a lot less litter'.<sup>32</sup> (A version of this slogan, 'A Little More Thought—Less Littered Butts!' can be found on the Keep America Beautiful website.<sup>81</sup>) The request for 'more thought' was 'comfortable and acceptable'.<sup>32</sup> In contrast, slogans suggesting that smokers 'pick up' their litter were rejected: although they might be persuaded to dispose appropriately of a butt they were holding, they were unlikely to pick one up once they dropped it.<sup>45 57 79 80 82</sup>

The imagery accompanying such campaigns was also a matter of concern. Most significantly, images of cigarette butts—the focus of the effort—were 'extremely uncomfortable for some smokers' and thus to be avoided.<sup>32 82</sup> Even the favoured slogan, 'a little thought, a lot less litter' was rejected when depicted with cigarette butts.<sup>32</sup>

### Portable ashtrays

Smokers were ambivalent about portable ashtrays. Some, ranging from 15%<sup>83</sup> to 53%, and up to 61% of women, said they would find such an item useful.<sup>84</sup> In one test, nearly 60% of those receiving sample ashtrays claimed they used them 'at least 1–2 times a week' and some said the ashtrays had 'made them pay closer attention to cigarette disposal'.<sup>85</sup> Smokers thought the ashtrays would be useful in places such as public parks, golf courses,<sup>57</sup> 'outside at work, outside the respondent's home, outside others' homes, and in the car'.<sup>57</sup> They also said they would use the ashtrays to 'convey a positive personal image around non-smokers'.<sup>57</sup>

However, some smokers were 'less enthusiastic' because they didn't 'feel a need to use an ashtray to dispose of cigarettes outdoors'.<sup>46</sup> Some claimed they smoked 'only in places where there are ashtrays', or disposed of butts in other ways.<sup>84</sup> Other smokers felt they would 'forget to use or carry' it,<sup>84</sup> especially because 'the process of flicking a cigarette butt on the ground is a well-ingrained, reflexive habit'.<sup>32</sup> Smokers also worried that the ashtrays would be smelly,<sup>32 35 84</sup> messy,<sup>32 47</sup> or dirty<sup>84</sup> and called carrying butts around in them 'revolting'.<sup>35</sup> These smokers felt that 'It would be easier to throw the cigarette on the ground'.<sup>35</sup> In response to these concerns, RJR stressed that the ashtrays were a temporary means of disposal, to be emptied as soon as practicable.<sup>69</sup>

### Permanent ashtrays

Tobacco companies and smokers frequently suggested that the cigarette litter problem was the result of clean indoor air laws causing more smoking outdoors,<sup>34 51 53 86–89</sup> where there were insufficient ashtrays.<sup>32 51 53 89 90</sup> However, the impact of permanent ashtrays was questionable. Employers who placed them in outdoor smoking areas commented, for example, that 'There are 30 butts in the ashtray and 100s around it'.<sup>91</sup> Studies noted that cigarette butt litter was often found 'within 5 m of a bin',<sup>92</sup> and about half of smokers said they would not bother to use an ashtray if it were 'more than 10 paces' away<sup>37</sup>; only

a third said they would walk further.<sup>93</sup> Half of Australian smokers said that if they 'knew it was a littering problem' they would 'make an effort' to use an ashtray, and 20% said they would use a convenient ashtray, but wouldn't go out of their way to use one.<sup>54</sup> PM found that although 72% of smokers who noticed the ashtrays they had installed said they used them, only 20% noticed them.<sup>94</sup>

## DISCUSSION

This study has limitations. The document set is not comprehensive, but a selection of litigation-related material. There has been no tobacco litigation to date concerning tobacco litter/waste issues, and there may be documents that contain additional information that could be revealed in the discovery process. We also may not have identified all relevant available documents due to the volume of the tobacco documents library.

The tobacco industry's research shows how much smokers disliked cigarette butts, littered or in ashtrays. Smokers found them smelly and dirty; they were unwilling to put them in their car ashtrays, carry them around in portable ashtrays, or hold them for more than a few steps to discard them appropriately. Creating butt litter made smokers uncomfortable even as they did it. Furthermore, smokers had multiple, sometimes conflicting, reasons for littering their butts: it was conscientious and rebellious, and it minimised their contact with an unpleasant reminder of their addiction. As the industry found, the complex psychology of butt littering made difficult identifying any message that might change the behaviour.

The tobacco companies perceived cigarette butt waste as a vulnerability that tobacco control advocates might exploit. Thus, they were motivated to solve the problem. However, the industry would not promote any messages that criticised smokers or called into question smoking itself. Their efforts—anti-litter campaigns and handheld and permanent ashtrays—did not substantially affect smokers' entrenched 'butt flicking' behaviours. These findings suggest that tobacco control programmes should not attempt to solve the problem by providing ashtrays or enhancing antilittering laws. Attempts to change the behaviour of smokers should focus on cessation.

More to the point, tobacco control should place the burden of cigarette waste on the industry. For more than 30 years the tobacco companies have feared the establishment of legislation or regulation compelling them to take responsibility for cigarette butt waste. Only recently has butt waste been framed as an economic and quality of life issue,<sup>5</sup> as opposed to an aesthetic problem. Such redefinition may encourage efforts to make the industry responsible for the toxic waste produced by smoking cigarettes. In other environmental waste areas, attention is focused on the waste producer. For example, the European Union Waste Electrical and Electronic Equipment directive makes producers and retailers responsible for recycling their products.<sup>95</sup>

Policy makers should be made aware that the presence of filters implies a degree of safety to smokers, but does not reduce smoking-caused disease, and that cigarette butt waste incurs a cost to communities and to the environment. Reconceptualising butt waste as an 'upstream' problem created by the tobacco industry may facilitate partnerships between environmental and tobacco control groups, leading to more innovative policy solutions that discourage smoking and

place the cost and consequences of filter waste on the tobacco industry.

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**Contributors** ES performed the research and initial draft of the paper; TN conceptualised the project and participated in the writing of the paper.

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